Believably immersive VR/AR experiences within the mining industry

THROUGH THE LOOKING GLASS

BACK TO THE FUTURE OF VR

Ulster University
Belfast Campus
3–5 Nov 2017

Ulster University

VSMM 2017

WELCOME TO VSMM 2017 — BELFAST

On behalf of the VSMM2017 organising committee, we warmly welcome you to the Belfast School of Art, which is one of six Schools within the newly restructured Faculty of Arts, Humanities & Social Sciences at Ulster University. One of the features of VSMM2017 at Belfast, is collaboration with industry. A number of partners will present their ARVR developments. Many of these companies are members of the Immersive Tech NI cluster or are supported by Digital Catapult NI.

Art and design practice has a long and rich history in Belfast and the school was established in 1849, making it the oldest in Ulster University. Since then provision has grown and thrived and today the school is one of the leading providers of art and design education in the UK and the largest on the island of Ireland. We provide a centre of excellence and an environment for innovation, creativity and energy. There are nine Research Units within the Faculty covering a diverse range of subjects. Three of those units have contributed to VSMM2017. Art and Design research is in the premier league of subject research in the UK. **In REF2014 its environment for staff and research students was peer reviewed to be 100% internationally excellent and world leading. Over 70% of the Research impact was judged to be 'outstanding'. The unit is ranked 3rd in UK for 4* research and sixth out of the 84 institutions assessed in the REF for Quality Index. Music and Drama were joint second in the UK for impact with 100% of research environment and impact rated as world leading or internationally excellent; Communication and Media had 100% of research environment and impact rated as world leading or internationally excellent.** Collectively we have over 85 PhD Researchers who are part of our University wide, Doctoral College community. **Ulster University is one of only six universities in the UK with 100% of its research environment rated as world-leading and similarly has world-leading research in all 20 of its Research Units.**

We hope you have a very productive conference, build new networks and enjoy your time with us.

—

Prof Frank Lyons Associate Dean for Research & Impact, Faculty of Arts, Humanities and Social Sciences

—

Dr Justin Magee Research Director for Art & Design

SCHEDULE OF EVENTS

Fri 3

—

FRIDAY 3RD NOVEMBER

12:30pm –	***Arrival & Buffet Lunch***
1:30pm –	Welcome by **Professor Kathy Gormley-Heenan**, PVC Research & Impact for the Faculty of Arts, Humanities & Social Sciences.
1:40pm –	**Professor Hui Wang** Chair of IEEE SMCS Northern Ireland Chapter: Welcome from IEEE NI
1:45pm –	**Keynote: Deepa Mann-Kler** – "Embodied Reality"
2:30pm –	**Track 7:** Creative Arts & Design
3:30pm –	***RETNE demonstration & Coffee break***
3:45pm –	**Keynote: Professor Suzanne McDonough** – "The challenges of conducting technology research in clinical populations"
4:30pm –	**Track 8:** Visualisation & Animation
5:30pm –	Tour of ARVR mini Expo. Evening reception starts and networking
6:30pm –	***Dinner (In ZEN)***
Night life	**Sound of Belfast Festival 2017**

—

TRACK 7 PRESENTERS
CREATIVE ARTS & DESIGN

Katie Graham, Abhijit Dhanda, Adam Weigert, Kyle Tousant and Stephen Fai
The VR Kiosk: How Passive Observant VR Storytelling Enhanced the Physical Tour of Parliament Hill and Disseminated the Rehabilitation Project

Kenneth Percy, James Hayes, Philip White, Christian Ouimet and Stephen Fai
Real // Virtual // Real, or, Aibohphobia (The Phobia of Palindromes)

Seana Kerr, Frank Lyons, Marlene Sinclair and Patricia Gillen
Co-creating a bespoke antenatal sonic environment, using mobile technology, to impact positively on the relationship that parents have with their unborn baby

Brendan McCloskey
Gamification, virtual physical objects, and the non-stigmatising assessment of upper-limb motor skills amongst musicians with cerebral palsy

Rebecca Crawford and Yuanyuan Chen
From Hypertext to Hyperdimension Neptunia: The Future of VR Visual Novels.

—

TRACK 8 PRESENTERS
VISUALISATION & ANIMATION

Joshua A. Fisher, Amit Garg, Wesley Wang and Karan Pratap Singh
Bauhaus Scenography for Virtual Environments

Miroslaw Narbutt, Jan Skoglund, Drew Allen and Andrew Hines
Streaming VR for Immersion: Quality aspects of Compressed Spatial Audio

Maxim Spur, Jimmy Coppin and Vincent Tourre
Virtually Physical Presentation of Data Layers for Spatiotemporal Urban Data Visualization

Toinon Vigier, Maxime Ameil and Vincent Tourre
Impact of visual immersion on perception of urban morphology and density in 3D city models

Sat 4

—

SATURDAY 4TH NOVEMBER

10:00am –	Welcome & coffee
10:15am –	Workshops morning session: **Professor Frank Lyons** — "Non-zero sum inclusive creativity participant session"
	OR / individual tour of ARVR mini Expo.
12:30pm –	***Lunch Buffet***
1:30pm –	**Keynote: Professor Eunice Ma** – "VR, AR and Serious Games for Raising Awareness of Sensitive Issues".
2:00pm –	**Plenary session**
2:30pm –	Workshops afternoon session: **Julian Stadon & Alan Hook** – "Oblique Strategies for Mixed Reality Art"
	OR / Individual tours of ARVR mini Expo.
4:30pm –	Creative XR: Overview by **Tom Gray** (Director of Digital Catapult)
4:45pm –	Closing comments
Night life	**Sound of Belfast Festival 2017**

Sun 5

—

SUNDAY 5TH NOVEMBER

11:00am –	Cultural tours
Night life	**Sound of Belfast Festival 2017**

KEYNOTE SPEAKERS

1

KEYNOTE No.1

> "Embodied Reality"

Deepa Mann-Kler is a multi-disciplinary artist, primarily working in neon and creating light installations. Her practice also includes painting, drawing and photography. She is the Founder of NEON, a company that combines creativity and latest technological innovation to create compelling commercial products in virtual, augmented and mixed reality software applications.

Neon works with health, education, tourism, marketing, gaming and entertainment. Neon identifies a need and uses the latest technology alongside their own unique creative approach to bring products to market. Technology is enabling consumers to choose how, when and where they use products and this is disrupting old modes of interaction and formats.

Neon works alongside the world's best designers and developers to bring virtual, augmented and mixed reality software applications to market from concept design, build, consumer testing, data gathering and launch. However, Neon is not just defined by the products they make but rather by the customer benefits they provide and the lives they improve.

Deepa directed and produced her first virtual reality experience called "RETNE" which was built for HTC Vive and demoed at SxSW17. Deepa is an internationally acclaimed, multidisciplinary artist with over eleven years' experience of major international exhibitions and public art programmes such as "Neon Dogs" and "Teenage Kicks", Artichoke/The Culture company Lumiere Festival, Derry UK City of Culture 2013, "Noli timere", Crescent Arts Centre, Belfast 2015 and "Release", Ulster Hospital Phase B, Emergency Department, Belfast (2017).

2

KEYNOTE No.2

> The challenges of conducting technology research in clinical populations

Professor Suzanne McDonough is a Professor of Health and Rehabilitation at Ulster University, an Honorary Research Professor in the School of Physiotherapy, University of Otago, NZ, a co-investigator in the UKCRC Centre of Excellence for Public Health (Northern Ireland) and a co-lead of the Northern Ireland hub, Council for Allied Health Professions Research (CAPHR, http://cahpr.csp.org.uk/).

Suzanne obtained her undergraduate degree in physiotherapy at University College Dublin (UCD) in 1989; was awarded her PhD in neurophysiology from Newcastle University, UK, in 1995; and a higher diploma in healthcare (acupuncture) in 2002 from UCD.

Professor McDonough is the lead for the Centre for Rehabilitation Research Technologies (CHaRT), part of the Institute of Nursing and Health Research (INHR) at Ulster University. 96% of the research in the INHR was rated as of international excellence or world leading in REF2014.

Professor McDonough is recognised internationally as an expert in the development and evaluation of interventions to promote rehabilitation in clinical populations (e.g. painful conditions, following stroke and older adults). She is particularly interested in the use of technology to actively support patients in their rehabilitation, as well as to promote general health and wellbeing.

Professor McDonough has research expertise in the design and conduct of Systematic Reviews, and Clinical Trials (both feasibility and main randomised controlled trials), and User Centred Design Studies.

She has played a key role in building research capacity amongst allied health professionals; and has supervised 24 PhD students to completion. Suzanne has excellent links with international rehabilitation researchers and is actively working with colleagues from Ireland, Italy, Sweden, New Zealand, Canada, USA and the UK. Given her interest in technology she has also developed expertise in building collaborations with colleagues from engineering and computing.

3

KEYNOTE No.3

> VR, AR and Serious Games for Raising Awareness of Sensitive Issues.

Professor Minhua Eunice Ma, Dean, School of Computing & Digital Technologies, Staffordshire University. Eunice is the Dean of School of Computing and Digital Technologies at Staffordshire University and Professor of Computer Games Technology. She is a world-leading academic developing the emerging field of serious games.

She has published widely in the fields of serious games for education, medicine and healthcare, Virtual and Augmented Reality and Natural Language Processing, in over 100 peer-reviewed publications, including 10 books on serious games with Springer. Eunice has received grants from RCUK, EU, NHS, NESTA, UK government, charities and a variety of other sources for her research on serious games for stroke rehabilitation, cystic fibrosis, autism, medical education, cultural heritage, Holocaust education and preventing gender-based violence.

Professor Ma is the Editor-in-Chief responsible for the Serious Games section of the Elsevier journal Entertainment Computing. She is the Founding Chair of the Joint Conference on Serious Games, which has been running for eight years in Derby (2010), Lisbon (2011), Bremen (2012), Trondheim (2013), Berlin (2014), Huddersfield (2015), Brisbane (2016) and Valencia (2017).

She gave a number of keynotes at Jury Symposium Visual Evidence 2010, the Anatomical Society Meeting 2012, CultureTech 2013, International Workshop on Waiting for Artificial Intelligence 2013, UK-US Serious Games for Health Workshop 2016 etc. She has been supervising 22 PhD students (6 completed) in digital games technologies and computer science.

With her team she has been leading the development of VR, AR and serious games for healthcare and education with broad impact in creative technologies and various application domains.

MINI-EXPO DEMOS

Project Title: **RETNE**

Authors: **Deepa Mann-Kler (NEON)**
Organisations: **NEON, Kainos, Enter Yes, David Baxter Audio, NI Screen, Invest NI, Digital Catapult.**

RETNE, if you haven't already guessed is, of course, the mirror-image of 'ENTER'. In the story, you enter through a mirror and when you return to that mirror having completed your journey, the mirror reads 'RETNE'. So much of the narrative is a metaphor for the concept of virtual reality: the mirroring of the real world to create new and exciting environments and possibilities, the journeys you can go on and the tasks you must complete to further that journey. Most appropriately, at the heart of RETNE is a quote from the philosopher, Aristotle: 'The whole is greater than the sum of all its parts'. As the product of an exciting, highly structured yet also incredibly fluid and fortuitous collaboration, the RETNE experience is already proving to be greater than the sum of its parts. RETNE is much more than an interactive short: it's a complete, creative immersive experience where the lightness of humour (a Northern Ireland characteristic) belies the sheer volume of complexity, innovation, ingenuity and effort. RETNE is now available on Steam and Viveport with over 18,000 downloads to date and licensing contracts with VR arcades in Canada and the US.

http://store.steampowered.com/app/622380/RETNE/

Project Title: **Believably immersive VR/AR experiences within the mining industry**

Authors: **Dr Justin Magee, Mr Terry Quigley & Mr Peter McGroarty**
Research Unit: **Art & Design Research**
Organisation: **Ulster University & CDE Global Ltd.**
Sponsor: **Innovate UK: KTP009750 (£89,995)**

CDE Global, the world's number one wet processing equipment company for sand and aggregates, mining, C&D waste recycling and industrial sands. Ulster University secured a 20-month Knowledge Transfer Partnership (KTP) with CDE Global to embed design-led methodologies, digital content workflows and VR/AR technologies into traditional heavy engineering industry. Communicating and experiencing such products is costly, time demanding and logistically complex, hitherto, only achievable through real life demonstrations. Believable immersive and empathic experiences are now possible digitally. This research focuses on the user experience from a visual immersion perspective. A precision full scale digital model was developed integrating realistic visual imperfections of object surfaces through complex digital texture maps, accurate animated machine functions, soft objects and fluidics. Digital content was developed using 3DSMAX (Autodesk), Z-Brush (Pixologic), RealFlow, Photoshop (Adobe), Substance Painter (Allegorithmic), and the Unreal4 games engine controlled by the HTV Vive enabling physical interaction with the quarry machinery.

This research captures customer empathy earlier and reduces the need for machinery exhibit at trade shows, expediting sales.

The digital content (including AR/VR prototypes) has been exhibited internationally: AGG1 Aggregates Academy & Expo (2016), 22nd -24th March, Nashville, USA; BAUMA (2016) 11th-17th April, Munich, Germany; Hillhead (2016) 28-30th June, England; ConExpo (2017) 7-11 March, Las Vegas, USA. This research helped to improve competitive advantage across eight global sales regions including North America, Europe and Latin America.

This KTP was assessed nationally, by Innovate UK, achieving the highest grade of 'Outstanding' and received a Certificate of Excellence Award (14th March 2017). It was selected by Invest NI to promote KTP's, 'Their business in your hands', and for the Digital DNA 2017 showcase 'Collaborate to Innovate – Harnessing the Knowledge from Universities and Colleges to Transform your Business Through KTP'. It was awarded the Ulster University Knowledge Exchange Impact award (2017).

Project Title: **Ulster Stroke Rehabilitation System**

Authors: **Holmes D, Charles D, McDonough SM, Morrow P, McClean S, Olivetti P, Barbabella F, Mårtensson, K, Pelliccioni G, Chiatti C, MT Charles, Mauro Catena**
Research Unit: **Institute of Nursing and Health Research, Computer Science Research Institute**
Organisation: **Ulster University**
Sponsor: **DEL studentship, EU Horizon 2020 Magic PCP Grant (£80,000)**

Ulster has over ten years of experience in working with virtual reality, augmented reality, and games to increase engagement with rehabilitation after stroke, and improve the effectiveness of self-managed rehabilitation therapy by designing robust assistive technologies that are feasible for unsupervised use. Videos of recent technology platforms supporting our research can be accessed through this playlist[1]. *Figure 1* shows the set up for a recent experiment, results of which were presented at ICDVRAT 2016 and received a best paper award.

Figure 1: Ulster's 1st stage TAGER Upper Arm Stroke Rehabilitation System Setup. *Figure 2:* illustrates the principle of our approach, where an adaptive control system loop operates in tandem with the serious game loop to provide an optimal rehabilitation experience for a user.

The core elements of the system are: modelling user motion in 3D space, adaptive intelligent system design (*see personalisation system in Figure 3*), a robust interaction system (mapping raw inputs to robust control gestures), AR/VR software and game design that is a good fit for therapy requirements and the gestural motion NUI system, and a gamification system that accounts for personality and preference.

We see real-time user input as an important modulating factor within the intelligent system's control loop and are exploring ways to provide meaningful and accessible real-time representation of performance. A further recent development of our system is the development of virtual Mirror Therapy (*Figure 4*). Mirror Therapy is a form of motor imagery where stimuli via the mirror "trick" generates sensory feedback (through Vision and Proprioception) to the side of the brain where the stroke has occurred.

The demonstration will offer the opportunity to experience Ulster Virtual Rehabilitation Platform in a seated and standing positions with and without mirror therapy.

[1] **https://www.youtube.com/playlist?list=PL-gRPjChk31_rDre-mJ6gbtMOSn6LExwE**

Figure 1

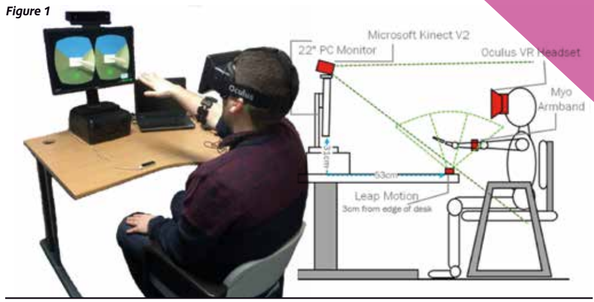


Figure 2

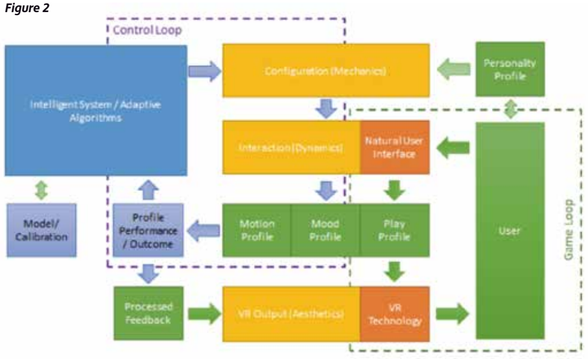


Figure 3

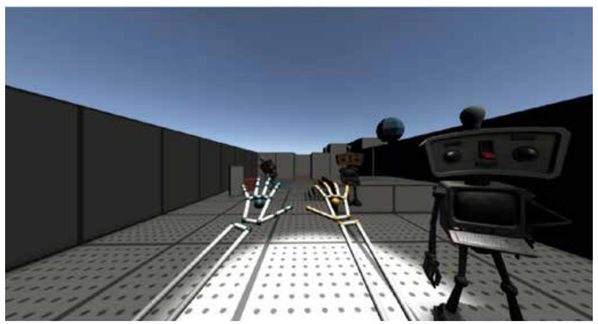


Figure 4

Project Title: **HistorySpace**

Authors: **Dr Helen Jackson & Adrian Hickey**
Research Unit: **Centre for Media Research**
Organisation: **Ulster University**

The History Space project is a location-based experience of the Downhill and Mussenden site, a place of significant cultural heritage on the north coast of Northern Ireland. The innovation in its production is access to digital media information exclusively through GPS systems, and an interface that engages with this data through augmented reality methods. Through these technology-led approaches to content design and delivery that includes geo-locative access, gesture recognition functionality, gamification methods and augmented reality-based navigation, the History Space model of user interface design offers a unique solution to the challenges of creating effective interfaces between physical places and digital spaces.

The History Space app was created through the EU funded Tourist Guide for Northern Periphery project (TG4NP). The aim of the wider TG4NP transnational project was to support the tourism industry in peripheral regions of Europe by enhancing the visitor experience in cultural and natural heritage destinations with the help of multimodal mobile information services. The core objective of the EU project is to exploit the latest existing mobile and web technologies to address the information needs and to enhance the experience of the visitors using innovation in location-based technologies. As its outcome, the project has developed new technology approaches to efficient and sustainable management and utilisation of resources in the natural and cultural heritage sector.

For further detail please go to http://www.historyspace.eu
History Space: Downhill Demesne, and is available for free, from both the Apple and Android app stores.

Project Title: **rediscOvery**

Authors: **Dr Helen Jackson**
Research Unit: **Centre for Media Research**
Organisation: **Ulster University**
Project Title: **rediscOvery**

This proof of concept project presents an augmented reality browser that layers historical photographic documents relating to the shipbuilding heritage of Belfast, to their modern day scene. In leveraging the potential of location awareness and mobile network connectivity to frame the communicative interaction between real world places and data-spaces, the visual system created by the augmented reality browser is an attempt to mediate a place-making experience that connects the user of the technology to the histories contained within the place in which it is operating. With this current trend in technical innovation that operates as a form of cultural practice creating new systems of representation, this proof of concept technology is being used to inform analysis of the modification of the symbolic codes of representation created by these computational processes.

It is the hypothesis of this project that technologies augmenting physical spaces with virtual data to create new forms of visual representation that intervene in the spatial and temporal dimensions of place, subvert the notion of invisibility and immateriality that traditionally operate in paradigms connected with these computational methods.

The project has been curated online at http://titanicrediscovered.com

Project Title: **The Use of Contemporary interactive/immersive technologies to investigate historical objects (and their application to teaching and research).**

Authors: **Martin McGinn, Michael Moore.**
Research Unit: **Art & Design Research**
Organisation: **Ulster University**

This research has examined and put into practice the use of 3D Scanning tools to record data from scans of a selection of Belleek Pottery from the Ulster Museum. Belleek Pottery in made in Northern Ireland 1857. Like many potteries across Europe, Belleek Pottery faces challenges of sustaining fine production in a saturated market of mass production. Contemporary technologies such as 3D scanning allows us to examine the significance of fine hand-made objects from a different perspective; a perspective that preserves a record of making techniques and examines in acute detail the structure and construction of these objects for archival purposes.

This documentation can also archive the hand making processes of the Belleek Pottery which globally are increasingly replaced by mechanical processes. This exhibit will demonstrate the potential to create an interactive and immersive learning tool (via AR/VR) for students to observe and engage with the making skills employed to create hand-made pottery and pull the historical making processes closer to contemporary digital technologies. This work is being carried out with support and the use of classic pieces from the Ulster Museum, Belfast. It will also showcase the potential to use VR/AR technologies in a museum and exhibition context for informing the public of the craft behind traditionally crafted pieces. In essence, this is the intention of this presentation/ workshop: to demonstrate that the digital (contemporary) and hand-made (increasingly historical) can co- exist and remain a relevant, sustainable and valuable direction for future industry and educational purposes.

Project Title: **Cinematic Virtual Reality – 'Fight Game' Carl Frampton, VR experience.**

Authors: **Philip Morrow, Jack Morrow, David Cosgrove, Jamie McRoberts, Rory Clifford**
Commissioned by: **BBC NI**
Organisation: **RETiniZE**

RETiniZE is a Cinematic Virtual Reality Studio – we create compelling VR content. Our mission is to create incredible immersive experiences that stretch the boundaries of the viewer and the medium. We work with major brands, sports organisations, theatre companies and broadcasters to create compelling VR content, from the blank page to the final product. Our goal is to harness this exciting new medium, using state-of-the-art 360 video, 3D stereoscopic vision and spatial sound to immerse people in breath-taking content, to embrace a new form of storytelling, and to teleport viewers to a whole new world. Our roots and reputations lie in high-end global film & television.

At heart we're experienced content people, with an intimate knowledge of the tricks and tech required to create truly unforgettable experiences. At VSMM we will be showcasing some of our recent work, including a VR film we made for the BBC featuring two-weight world champion boxer, Carl 'the Jackal' Frampton.

Project Title: **LiveVR - 360 degree video delivery platform**

Authors: **Gavin Kearney**
Organisation: **Silverink**

Silverink is a digital development company specializing in immersive media. Until recently, Virtual Reality was firmly in the realm of science fiction. But with a group of local companies harnessing a groundswell of enthusiasm, Northern Ireland has potential to become a hub of immersive creativity. LiveVR enables users to instantly stream video content to VR headsets, browsers and mobile devices anywhere in the world. Maintaining smooth video delivery over changing networks to an unknown number of global users on fast-changing devices/software presents a number of technical challenges. And with 360 streaming competition from the likes of Facebook and YouTube, it's not easy to differentiate the offering. But the impact of immersive video is huge, and the market potential vast. Live 360 VR video has clear applications in the worlds of Sport, Entertainment, Tourism, Security, Business, Health, Property and Education. With updates rolling-out over the coming year, our goal is to establish LiveVR as a leading VR streaming platform.

Ciaran Lavery on Colorado River at SXSW 2017:
http://livevr.io/360-vr- events/sxsw-2017/austin- boat-ride/ciaran- lavery

University of Ulster 2017 Fashion Show (timelapse)
http://livevr.io/360-vr- events/silverink/UU-Fashion- Show/timelapse

Project Title: **StarScapeVR**

Authors: **Laura Russell**
Research Unit: **N/A Graduate project in BSc (Hons) Creative Technologies**
Organisation: **Ulster University**

StarscapeVR (2017) is an immersive, virtual environment with interactive 3D computer graphics, using a stereoscopic head-mounted display (HMD) and real- time motion tracking in 3D space to simulate a tranquil, realistic lakeside space for star gazing and exploring the constellations in the night sky. The setting is designed to evoke an emotive sense of awe, informed by Gaggiolis' (2016) theories on how Virtual Reality possesses transformative potential; allowing the user to embody another person's subjective experience. The project used a range of software; Unreal Engine 4 (UE4), Adobe Creative Suite, Blender and World Machine delivered on the HTC Vive Virtual Reality system, bringing together a culmination of creative mediums to assemble an immersive and complete experience.

The piece itself replicates a memory, enhanced to have a surreal artistic quality and bring a level of realism to blur the lines between reality and the virtual. Inspiration was drawn from existing examples of VR exhibitions and experience such as Dreams of Dali (2016) and Doors (2016). Both of which challenged the use of physical and virtual space to showcase the limits and strengths of VR. High levels of immersion present in the aesthetic detail were used to replicate the users senses, experimenting with the ability to create a realistic environment.

Walkthrough demonstration https://vimeo.com/219807588

Project Title: **Japanese Architectural Practices in VR**

Authors: **Vincent McIlduff, Adisak Yavilas, James Stewart**
Organisation: **ALT-254**

ALT-254 is an Architectural Visualisation company based in Hong Kong. At ALT-254, it is our intention to streamline the design & construction process making it as effortless as possible for the client. The industry is currently divided between numerous specialist consultants, the control of which is often vague and complicated which can lead to the breakdown of communication and inefficiency.

We intend to change this by creating a system where the Architect and Project Management are one entity, and by employing the use of Virtual Reality work flows and tools, we can communicate and control the entire build process from concept to completion. This enables us to reduce the project's overall build time and improve communication between all members of the project team ensuring the client receives exactly what they want on-time and on budget.

Project Title: **Visualising 3D printable information in the cloud**

Authors: **Niall Haslam, Luke Donnelly, Daniel Crawford**
Organisation: **Axial3D**

At axial3D we produce anatomic models from medical image data. This involves the translation of 2D images into 3D objects. This is all done within our cloud based platform. The platform allows the anonymous upload of medical image data. These images are then annotated using our algorithms to identify the anatomy and label. The result of this annotation process is a 3D model of the anatomy that is displayed to the user.

Our visualisation platform allows the user to interact with the model and make further annotations on it. This allows us to capture information from the clinician about the requirements of the print. This is key for communication of requirements between the surgeon ordering the print and the medical visualisation engineers and radiologists that are preparing the print. This visualisation platform is vital for increasing the accuracy of communication about the 3D object.

The platform addresses the major challenge of translating information about the 2D images in 3D space which is a more intuitive place for communication to happen. Overall we have demonstrated the utility of visualisation of 2D data in 3D for the purposes of ordering anatomic models.

Project Title: **ARVR various applications**

Authors: **Leona Hill**
Organisation: **EdgeWays**

Edgeways is a creative and immersive digital studio based in County Armagh with an expert team of VR/AR modellers and developers. They will exhibit four different applications of ARVR technologes. Architectural VR enables people to visualise plans for both interior and exterior including customised features. It enables spatial exploration and interaction, where materials, physical layout, decorative features specification can be changed using the haptic controls. In creating this slimline process from plans to VR, edgeways came across a variety of issues. User experience and intuition is a key design aspect for this type of application due to the diverse user groups. Neuron Linguistic Programming (NLP) VR Platform will initially be used for Pain relief, Anxiety, Fears and Addictions. Northern Ireland has the highest cost of anti-depressants prescribing per head within the whole UK. With a cost of £8.61 compared to England which is £5.27 per head.

The Northern Ireland mental health report in 2016 reported that, Northern Ireland is reported to have a 25% higher overall prevalence of mental health problems than England. Similar rates of poor mental health were reported in a 2013 study into the prevalence of mental health disorders in Northern Ireland, which suggested rates of 23.1%. The immersive nature of VR allows us to create places of respite for those experiencing chronic pain or anxiety. We can go further and use VR and principles of gamification to teach people a range of pain reduction techniques which the can then use outside the VR experience. We propose that marrying Virtual Reality and proven psychological tools and forms of education will offer a pain relief, anxiety and impulse control alternative to many people. 3D Organon VR Anatomy.

The world's first fully-featured virtual reality anatomy atlas. 3D Organon VR Anatomy is an award winning immersive self-discovery experience into the human body. All-in-one Solution for Learning Clinical, Topographic and Systems-based Anatomy. The software permits many levels of interaction and learning only achievable through the use of VR technology. Scenario training is tried-and-tested technique that has been used by the military, large industries and the emergency services to effectively train employees. It was serious games and virtual world technology that first enabled this training to be run digitally. Research conducted into virtual training has shown increases in knowledge retention up to 70% higher than traditional real-world training.

Naturally, virtual training is also particularly useful if learning is conducted in dangerous or hazardous situations. We utilise custom-built interactive 3D environments to enable businesses to give their staff the most immersive training experiences possible and strengthen learning in a space that is both safe and familiar. We want to make this technology accessible to small and medium sized firms as well as larger organisations.

Videos

Architectural VR Video – https://goo.gl/z1skPU
Training staff inside VR – https://goo.gl/UHxPhn


Project Title: Japanese Architectural Practices in VR


Project Title: Cinematic Virtual Reality – 'Fight Game' Carl Frampton, VR experience.


Project Title: Believably immersive VR/AR experiences within the mining industry

Project Title: ARVR various applications

Shaping the Future of the Creative Industries

Ulster University's Creative Industries Institute is an exciting new initiative that brings together our advanced research and teaching expertise in creative disciplines to collaborate with industry, government and communities, focusing on skills acquisition, job creation, policy development and future-led research.

With roots established centuries ago in traditional disciplines, like storytelling, music and ceramics, to linen, textiles and fine arts, Northern Ireland has one of the richest and most exciting creative industries sectors in the world. It is a sector that has grown and evolved on an international stage, becoming a place where the traditional isn't lost, but is celebrated, and merged with new thinking, new technology and new talent. Ulster University is at the heart of that evolution. Our Creative Industries Institute, collaborating with industry, government and community partners, will drive and inspire new, ground-breaking advances, enhance skills and maximise future economic growth. Ulster has world-leading expertise in all areas in the sector as defined by DCMS, including advertising, architecture, broadcasting, crafts, design, creative technologies, fashion, film, heritage, museums & galleries, music, performing arts, photography, publishing, video games, visual arts and virtual reality.

—

Creative disciplines at Ulster

Leading the way in interdisciplinary research collaborations

Importantly, creative disciplines at Ulster lead the way in interdisciplinary research collaborations. For example in performing arts with computer engineering and nursing; virtual reality and augmented reality (VR/AR) and rehabilitation; music technology and disability; big data in arts and humanities; and product design and smart textiles for health. Ulster is investing significantly in the creative industries as a core part of its flagship £300million Greater Belfast Development, in addition to the £9million Media and Broadcast facilities in the recently opened Arts block in Coleraine, and a £5million investment in new posts to drive new courses and research in VR/AR, Game Design and Post-Production VFX in the new Faculty of Arts, Humanities and Social Sciences.

Our research will advise and inform government and help to shape policy relating to creative industries, and through the development of evidence databases, we will support and accelerate advances in this sector. We will invest in skills generation and develop new course provision to address clearly identified skills needs in areas such as:

- VR/AR
- game design
- post-production
- broadcast
- media

—

As well as economic value, the creative industries make a considerable contribution to societal and cultural development offering an alternative and successful paradigm, creating a new model for cultural expression, personal growth and well-being.

—

ulster.ac.uk/cii

What our Institute offers

CREATIVE INDUSTRIES INSTITUTE

DEVELOPMENT OF EVIDENCE DATABASES

INDUSTRIAL PARTNERS RESEARCH COLLABORATION

ACCELERATING ADVANCES IN CREATIVE SECTOR

GOVERNMENT POLICY ADVISORY PANELS

WORLD-CLASS RESEARCH WITH IMPACT

NEW COURSE PROVISION ADDRESSING SKILLS GAPS

ULSTER UNIVERSITY
STUDENTS' UNION

UNIQUE

Visit.
See.
Buy.
Enjoy.

Visit us on Ulster University Belfast Campus

Open to everyone

Unique Art and Design shop is an educational and recreational platform for students, alumni and the general public, which connects Ulster University with Belfast and Northern Ireland's creative community. It offers an exclusive outlet for emerging artistic talent from the University, providing them with a platform to gain exposure, make professional connections and sell work.

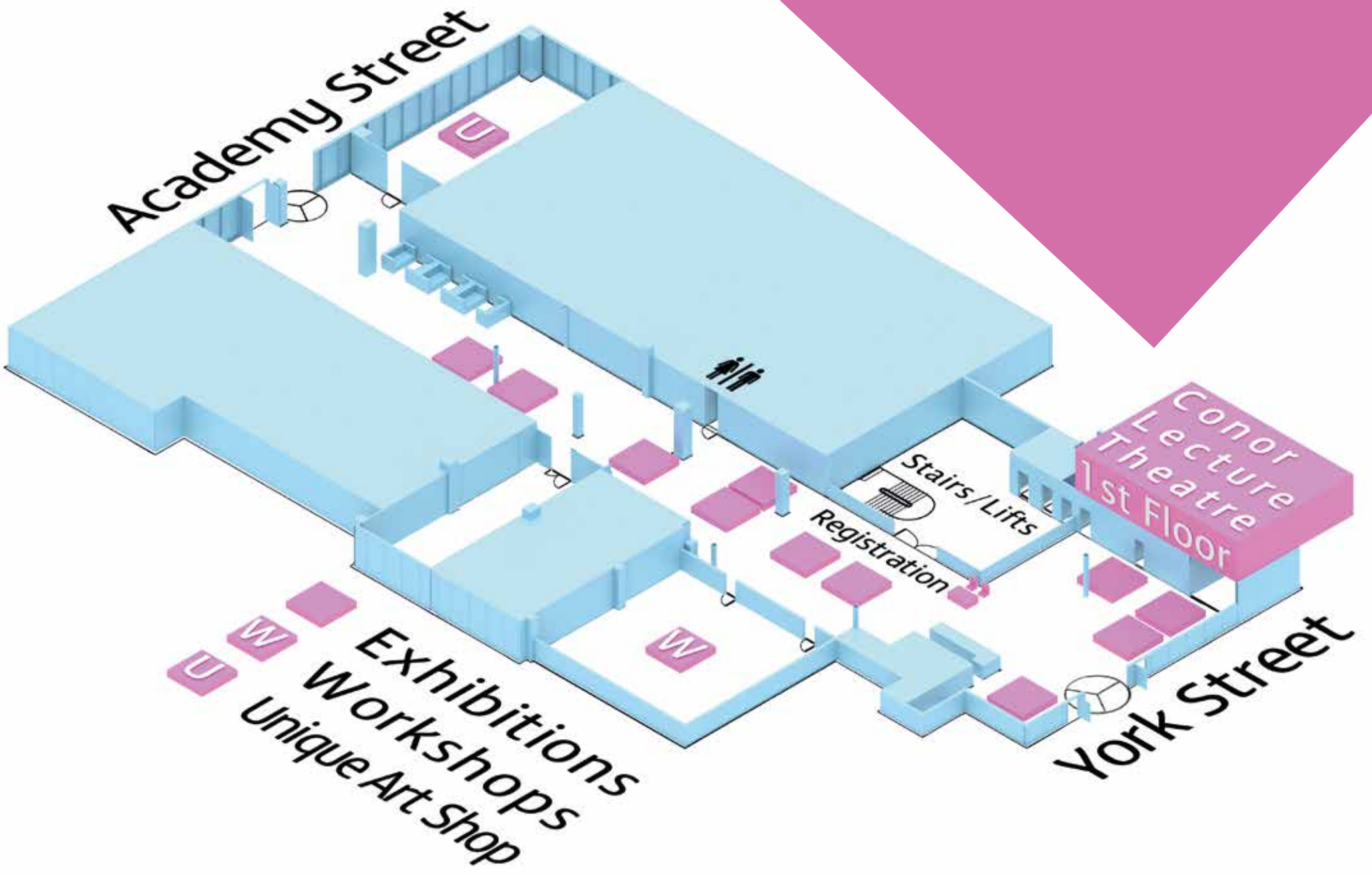
Unique features pieces from a wide range of art and design disciplines including paintings, photography, ceramics, sculptures, jewellery, fashion, graphic design, illustration, printmaking, textiles and fine art. Customers can also commission items from the students and alumni.

The shop is managed by two full-time placement students and has a volunteering programme for other students to get involved. As a social enterprise all income from the sale of items is used to facilitate workshops and events for the public to learn from Ulster University students through pottery classes, sculpturing, painting and more.

Opening Times
Mon–Fri 10.00am–3.00pm
Sat 11.00am–3.00pm

ulster.ac.uk/artshop

FLOOR PLAN



Mini Expo Demonstrations

- **RETNE**
- **Believably immersive VR/AR experiences within the mining industry**
- **Ulster Stroke Rehabilitation System**
- **HistorySpace**
- **rediscOvery**
- **The Use of Contemporary interactive/immersive technologies to investigate historical objects** (and their application to teaching and research).
- **RetInize 'Fight Game'** Carl Frampton, VR experience.
- **SilverInk** 360° live video
- **ALT-254** Japanese Architectural Practices in VR
- **EdgeWays** ARVR various applications
- **Axial 3D** Visualising 3D printable information in the cloud

Ulster University
Belfast School of Art
York Street, Belfast
BT15 1ED

ulster.ac.uk